

ABSTRACT

Light signals of first to n-th bands amplified en bloc undergo proper attenuation through an adjustable optical attenuator in conformance with attenuation in an optical fiber connected to input of an optical amplifying repeater apparatus, whereon the light signals are demultiplexed or separated into individual bands and amplified by first to n-th fixed-gain optical amplifiers (#1, ..., #n) each having a high fixed gain in the respective bands to be subsequently multiplexed by an optical multiplexer and then sent out onto a transmission line. A monitoring light branching device extracts a part of light power of a specific monitoring wavelength, which is then fed to an adjustable attenuator control circuit which controls the attenuation factor of the adjustable optical attenuator so that the light power of the specific wavelength remains constant. The gain of the optical amplifying repeater apparatus at the specific wavelength can thus be determined. By employing as the optical amplifying medium a substantially homogeneous medium, the gain for the other wavelengths can be fixed. The optical amplifying repeater apparatus whose gain is essentially independent of the change in the number of the wavelengths can thus be realized.